

P R O M O T I N G

# Safety

OCCUPATIONAL  
HEALTH  
&  
SAFETY  
HERITAGE  
GRANT  
PROGRAM



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**T**he Occupational Health and Safety Heritage Grant Program, a \$10-million investment of the Alberta Heritage Savings Trust Fund, supports projects which will provide solutions to high-priority occupational health and safety problems. Like other Occupational Health and Safety Division programs, its ultimate goal is to prevent ill health and promote healthy lifestyles among all Albertans.

The program supports research, training and educational activities directed at preventing work-related accidents and ill health, and promoting good health through the improvement of working conditions. This report highlights a few of the larger projects funded since the program was established in 1981. Some projects are still underway. Others are complete and their results are being applied at work sites throughout Alberta.

The funded projects have resulted in many new and innovative occupational health and safety programs and effective strategies for their delivery to workers.



**B**ecause of their complexity and diversity, many occupational health and safety problems require "non-traditional" solutions. This usually entails an approach which draws upon expertise from a variety of fields. The Grant Program has funded a number of projects that tackle problems using this multidisciplinary approach.

An excellent example of an occupational health problem whose solution is not found in any one area is back problems. These recurring injuries cause pain and suffering for thousands of Alberta workers and cost millions of dollars in annual Workers' Compensation Board payments.

Preventive programs use insights from many fields including: ergonomics — redesigning the work area and work process; engineering —

using a tool or machinery to move heavy loads; education — training workers to lift correctly; psychology — ensuring that safe work practices are easy to perform and are reinforced; and medicine — determining fitness to return to work.

Studying occupational health and safety problems in this multidisciplinary way has made new approaches and programs available to Alberta workers and companies for implementation in their workplaces.

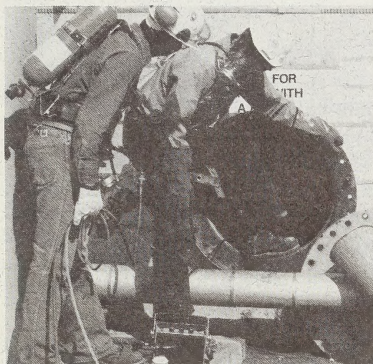


## Confined Space Entry

*Five oilfield workers were swabbing a newly drilled well. One worker, working alone while gauging the fluid level in an adjoining tank, either climbed or fell into the tank and was overcome by fumes or a lack of oxygen. A second worker entered the tank to attempt a rescue — he was overcome. A third worker entered the tank, became ill but was able to get out. A fourth worker entered the tank, and was overcome. A fifth worker entered the tank and became ill, but was able to get out. The three workers who were overcome died. None of the crew wore respiratory protective equipment.*

With restricted access or means of escape, confined spaces make particularly hazardous workplaces. Between 1976 and 1987 in Alberta, 42 fatalities involved entry into confined spaces. To train workers in this specialized area, Lakeland College has offered a course in confined space entry and rescue since 1986.

Because this program has been highly successful in meeting the needs of workers, it was recognized that a similar course on the safe entry needs of workers in vertical confined spaces was also required. When work is done at heights, all the problems experienced by workers on the ground are compounded by fear of heights, restricted work area and lack of accessibility.



Offering the courses at the work site eliminates the need for worker overtime, travel expenses and travel time. This makes the course particularly well suited for training oil and gas industry workers in remote areas. The portable tower unit consists of a 7.3 metre tall steel cylinder which simulates actual tower conditions. The program covers simulated entry and rescue situations, familiarity with hazards, safe work procedures and the awareness of personal limitations.

## Handling Hazardous Wastes

It's not only large companies that recycle or dispose of chemical wastes, but teachers, researchers and hospital workers handle wastes as well. Although the quantities of waste they deal with are often small, efficient and practical disposal or recycling ensures their own safety, the well-being of co-workers and students, and the health of the environment.

Researchers with the University of Alberta's Department of Chemistry have produced two guides to the disposal and recycling of chemicals. The first deals with hazardous chemicals and the second with potentially carcinogenic chemicals.

Over 7200 copies of the first publication and 1400 copies of the second publication are now in circulation. Seminars have been given to high school teachers and school laboratory technicians around the province, and project results have been presented at numerous national and international professional conferences.



In addition to the information in the guides, the researchers have responded to enquiries from companies with specific disposal problems.

One example of a practical disposal method developed by the research involves pouring a mixture of soda ash, clay cat litter and sand over a chemical spill. Once the liquid is absorbed, the mixture is scooped into a container and treated. After being left overnight, the solid residue can be discarded as normal garbage.

## Taxi Driver Safety

*As a result of a fare dispute, a taxi driver was attacked by his passenger. The driver was unable to return to work for nearly 10 months.*

Taxi drivers are all too often the victims of robbery, assault and even murder. For example, there were 12 armed robberies of taxi drivers in the first eight months of 1984 in Edmonton. But although taxi driving is a hazardous job, drivers are generally offered very little in the way of safety training.

Crime statistics and interviews with taxi drivers, compiled for the 1985 study "Taxi Driver Safety in Alberta," substantiated the need for a safety training program for taxi drivers. The drivers themselves felt they required training in public relations, particularly in terms of dealing with difficult passengers.

In 1987, the Taxi Industry Task Group — representing taxi commissions, drivers and brokers — submitted a successful proposal for the development of a safety training course. Program production is now underway. Course content will focus on preparing drivers to deal with aggressive and potentially dangerous passengers.

The course will make use of a videotape and training manual, and will be flexible enough for use in classrooms, at company safety meetings or for individual review. The longer term goal of the project is for taxi commissions across the province to make successful completion of the course a condition of obtaining a chauffeur's permit.



## Back Injury Prevention

*As the nurse helped the patient from a wheelchair to his bed, the patient slipped. While stooping to catch him, the nurse felt a sharp pain in her lower back. Diagnosed as having lower back strain, she was off work for approximately three months.*



Although the motion took only a second or two, the damage took months to heal. It's an all-too-common scenario. Roughly 80 percent of Canadians will, at some point during their working lives, experience back pain. In Alberta, back injuries account for one out of every four lost-time claims submitted to the Workers' Compensation Board.

One project is evaluating the effectiveness of an innovative approach to reducing back injuries. Called Sage Analysis, the technique has been used at two high-risk work sites — a hospital and an open-pit mine.

Sage Analysis is founded on the philosophy that workers who experience a problem must be involved in its solution. Frequently, worker input is ignored in favour of so-called "expert" analysis.

Preventive programs are now in place at the two work sites and lost-time claims are being monitored. A before and after measurement will be used to evaluate the effectiveness of the approach. A manual has also been developed to describe the procedure, thus allowing other companies to conduct a similar analysis.



# 6 UNDERSTANDING HYDROGEN SULFIDE

While Alberta's abundant oil and gas fields are a boon to the economy, exploration and production workers can face a serious health hazard.



Hydrogen sulfide occurs naturally in oil and gas formations. At high concentrations, hydrogen sulfide is a killer. At lower concentrations, it can cause a variety of adverse health effects.

As the Canadian centre of the oil and gas industry, Alberta is a natural place to develop expertise and conduct research on hydrogen sulfide. The Grant Program has supported this work over the years and currently funds two research groups at the Universities of Alberta and Calgary.

Researchers are tackling the many unanswered questions about how hydrogen sulfide affects human health. This information is vital to developing effective treatment programs and to understanding both the temporary and permanent effects of hydrogen sulfide poisoning. Some of this work focuses on the effects of exposure to low hydrogen sulfide concentrations. Research findings will benefit workers, as well as the general public living in proximity to oil and gas fields.



## Neurological Actions of Sulfide

*A worker was filling a tanker truck with condensate when he opened the hatch to check whether the tank was full. He was immediately overcome by hydrogen sulfide and fell 6.4 metres to the ground. He died of injuries sustained in the fall.*

Exposure to hydrogen sulfide is a significant cause of sudden death in Alberta workplaces. Hydrogen sulfide exposures usually occur during drilling for natural gas and crude oil, and the production of petroleum products. However, workers have also been killed by hydrogen sulfide in agricultural and industrial accidents.

Exposure to high concentrations of hydrogen sulfide affects the part of the brain which controls breathing, causing unconsciousness then death. Following recovery from lower concentration exposures, people have experienced memory losses, tremors and psychological changes.

A need for research on the effects of hydrogen sulfide on the brain and the nervous system prompted the Grant Program to fund this work at the University of Alberta's Department of Pharmacology.

The researchers are examining whether hydrogen sulfide blocks the communication between nerve endings. The study is also examining the transmission of a nerve impulse within isolated nerve cells in a "test-tube" setting. Further research may lead to treatments or antidotes for hydrogen sulfide poisoning.

## Low Dose Effects of Hydrogen Sulfide

*A rig worker was exposed to hydrogen sulfide gas and lost consciousness. He was revived in the hospital emergency ward. He recovered, but was unable to return to work for nine days.*

"Knockdown," the sudden exposure to high concentrations of hydrogen sulfide, is known to be a killer. However, low doses of hydrogen sulfide also cause adverse health effects such as headaches, sleep disturbances, nausea and weight loss.

Although other hydrogen sulfide studies have been carried out, it is not known whether continued exposure to low concentrations of hydrogen sulfide affects the body's organs and tissues. The Occupational Health and Safety Heritage Grant Program is making it possible to fill this information gap by funding research at the University of Calgary, Department of Pharmacology and Therapeutics.



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The study will determine whether low levels of hydrogen sulfide alter the structure and function of various tissues. The researchers are examining lengthy low levels of exposure to see how they affect behaviour, neurological function, tissue biochemistry and genetics.

Among other things, data from these experiments will be used to develop better treatments for hydrogen sulfide poisoning, and ways to protect the health of workers who may be at risk.



**A**lthough independent researchers or government agencies often come up with solutions to occupational health and safety problems, industry and labour organizations are in the best position to identify their members' needs. They are also in the best position to transmit and implement programs in the workplace.

Consequently, the Grant Program funds a variety of health and safety initiatives launched by Alberta industry, professional and labour organizations. These groups have developed innovative projects to improve employee working conditions.

Many of these projects focus on extending occupational health and safety programs and services to small businesses.

This work provides the stimulus for improving the health and safety record of small business.

## Occupational Health and Safety Week

A grant assisted the Canadian Society of Safety Engineers (Alberta) to carry out activities for the national Occupational Health and Safety Week in June 1988. The theme of the special week was "Safe at Home, Safe at Work."



Alongside province-wide activities, separate promotional activities were carried out by the six Canadian Society of Safety Engineers chapters in Medicine Hat, Lethbridge, Calgary, Red Deer, Edmonton and Fort McMurray. Activities included seminars, news conferences, municipal proclamations of safety week, mall displays, publication of a directory of local safety personnel, poster contests, forklift rodeos, and newspaper and radio ads. The week's activities increased awareness of the need for safety both at home and at work and created a positive safety attitude.



## Farm Equipment Manufacturers Safety Program

*A worker was painting steel "A" frames. Another worker knocked the stack and some of the frames fell upon the first worker. He sustained a fracture and bruises, and was unable to return to work for a month.*

When the Prairie Implement Manufacturers Association (PIMA) took a close look at the accident rate of the companies it represents, the news was not good. The firms, most of which employ fewer than 50 people, have a lost-time accident claim rate twice as high as the average for all Alberta industries.

Part of the reason for the poor safety record lies in the isolation of these companies. They are scattered throughout the province, usually in very small centres, and are thus difficult for occupational health and safety specialists to reach. The majority of these plants do not run formal safety programs.



PIMA was awarded a grant for an experimental project to share the services of a safety consultant. The project is designed to demonstrate that, by working together, a group of small businesses in a common industry can benefit from the services of a full-time occupational health and safety consultant.

A safety consultant is conducting safety audits at approximately 80 firms that manufacture farm and farm-related equipment. The entire safety structure of each organization is being studied with a view to identifying strengths and weaknesses. This will provide a measure of the effectiveness of a company's health and safety program and supply the impetus for change and improvement.

## A Health and Safety Guide For Small Business

*A salesperson in a small store strained his back while lifting a box. The employee was unable to work for three weeks.*

Large companies can, better than small businesses, afford the time, money and personnel needed to implement occupational health and safety programs. This condition is reflected in lost-time statistics. The lost-time claim rate of small employers is consistently higher than that of large employers.

The large number of small companies and their wide geographic distribution make it difficult to deliver the occupational health and safety message. One positive step lies in encouraging small business owners and managers to give a high priority to health and safety by increasing their awareness of the moral, legal and financial importance of good safety practices.



The Canadian Organization of Small Business is producing a "Health and Safety Guide for Small Businesses."

The guide will serve as a ready reference for establishing and maintaining a comprehensive health and safety program while recognizing the limited capital, resources and time available in small businesses.

Production of the guide — a concise manual with supplementary reference material — is now under way.

## Training Labour Representatives

A program designed to give a relatively small number of workers advanced health and safety education has now benefited hundreds of Alberta workers.

The program started in 1982 with a grant to the Alberta Federation of Labour (AFL) to train 30 Alberta union representatives as health and safety instructors. The participants went through a rigorous month-long program — one week of teacher training, followed by three weeks of student teaching and presentations on health and safety technical information.

The group went on to teach over 200 health and safety representatives from 25 Alberta unions. As a result of their training, these representatives brought to their classes a combination of specialized teaching techniques and up-to-date technical information. Their extra effort has benefited many Alberta workers, either through direct participation in a class or by working side by side with graduates.

One of the participants in the instructor training course, Bob Zorniak from the United Steel Workers of America, said, "The hands-on experience in organizing presentations and actually giving them was very helpful. The program provided a valuable exchange among the students and instructors who all had a wealth of knowledge to share."

Spurred on by the success of this program, a second project, jointly funded by the AFL and the Grant Program, was undertaken to further develop the skills and knowledge of the instructors and prepare a manual for advanced health and safety education.

The Advanced Instructor Training Manual is now used in Alberta by the United Steel Workers of America, United Mine Workers of America, Energy and Chemical Workers Union, Alberta Union of Provincial Employees, and Canadian Union of Public Employees.



**B**ecause workers need to know how to perform their jobs safely, the Occupational Health and Safety Heritage Grant Program supports the development of innovative training aids and reference materials. The program funds projects which emphasize the recognition, avoidance and control of work-related hazards.

Some Occupational Health and Safety grants have helped associations to develop new training materials. Special attention is given to ensure that the information is conveyed in an easy-to-use and effective format.

The Grant Program has supported several projects aimed at supplying the latest information on occupational hazards. Some educational material increases workers' awareness of hazards, some aids instill a "safety first" attitude, and other material gives specific information on safe work practices.

### Forestry Safety Materials

*A skidder operator was anchoring logs when two rolled off the pile and pinned his foot, breaking his leg. He was unable to work for nine months.*

For those of us with desk jobs, it's hard to imagine a job where a second of inattention can cause a serious or even fatal injury. But for loggers in the bush, this is a fact of life.

During 1977-1981, the average lost-time claim rate for logging and related industries was more than twice the average provincial rate for all industries. On the brighter side, since 1984 the lost-time claim rate for all forestry industries has decreased by 25 per cent.

Some of this improvement is likely related to the safety education initiatives launched by the Alberta Forest Products Association (AFPA) and supported by the Grant Program. The AFPA has produced three safety manuals: "Chain Saw Safety Manual," "Logging Safety Manual," and "Safe Log Transport." Available since 1985, 7500, 4000 and 6000 copies, respectively, have been distributed.



The chain saw manual covers all aspects of working with a chain saw. It acts as a reference for the backyard amateur or as a refresher for the seasoned pro. The logging safety manual is geared to logging professionals and is an ideal companion to logging industry safety programs. Clear and concise measures to reduce accidents while loading and moving logs are part of the booklet on safe log transport.

A high quality videotape on chain saw safety has also been produced. The video reviews the proper use and maintenance of chain saws. It is suitable for industry and home use, either as a stand-alone teaching aid or as a resource within a training program.

## Safety Training For Forestry Workers

*As the faller backed up from the tree he had cut, he stepped into a hole and fell backwards. The falling tree knocked another tree on top of him, causing his death.*

Accidents like this one are particularly frustrating, because they can be prevented. A faller working safely would have cleared the area around the tree to avoid tripping, and would not have fallen one tree into another.

To get the safety message across, particularly to small companies without a designated safety supervisor, the Alberta Forest Products Association developed an instructor's manual which foremen can use to teach logging safety to woodworkers. The training can occur at the work site.

The course covers the basics of chain saw use as well as the advanced professional techniques of falling trees. The course's 29 modules are designed to be used independently so that an instructor can pick out the topics which best match the workers' training needs.







## Welding Safety Videotapes

*A welder was fabricating storage tanks. Exposure to the welding fumes led to bronchitis. The worker was unable to work for four months and had to retrain for a different occupation.*

Burns, hearing loss, lung and eye damage are just a few of the occupational injuries sustained by welders. From 1985-87, nearly 4400 welding injuries were reported in Alberta. Most of these injuries could have been prevented by following proper safety procedures and using personal protective equipment.

To acquaint workers with the hazards, and the precautions that should be taken, the Northern Alberta Institute of Technology produced a series of five welding safety videotapes and a complementary workbook.

Since the completion of the videotapes in January 1987, the quality of the series has gained national and international recognition. Russ Ramsay, Executive Vice-President and General Manager of the Industrial Accident Prevention Association (IAPA), said, "The videotapes and workbooks are of exceptional quality and will have a positive impact on Ontario workplaces." The IAPA purchased 33 copies of the series for loan to its 63 000 member firms. Other users include the Canadian Coast Guard, Syncrude and Dupont Canada.

Seventy-six sets of the videotapes and 600 manuals have been distributed in Canada. American distribution began recently and an Australian distribution agreement is under negotiation.

## Construction Accident Prevention

*A worker was replacing a wall-mounted skylight when he fell, nearly 3.1 metres, from the ladder on which he was working. He died after striking his head on the concrete walk below.*

The Wynn Task Force on Construction Safety concluded that a major contributing factor to the high lost-time claim rate in Alberta's construction industry was the lack of adequate safety training. Responding to recommendations made by the Task Force, the Alberta Construction Association produced a variety of educational materials for on-site safety programs.

The "Can Do!" project produced three videotapes. "Basic Management Skills," and its complementary instructor's manual, covers typical management/staff problems and presents practical solutions. "Site Orientation" presents the site superintendent's roles and responsibilities when preparing a work site plan. "On Target with Ladders" uses a humorous approach to teach general safety rules for using ladders.



It is expected that the recently formed Alberta Construction Safety Association will make these videotapes a key component of its safety program.



## Safe Work Practices Training

*Two workers were sent into a 5.4 metre deep trench by their employer. The trench was improperly cut back and was not shored. The two workers were buried when a portion of the trench wall caved in. One of the workers was fatally injured.*



Trenching, only one of a number of hazardous jobs in oilfield work, claimed 25 lives between 1976 and 1987 in Alberta. A grant assisted the Oilfield Contractors Association to develop materials aimed at increasing the awareness of oilfield safety among supervisors and workers.

Three videotapes, with accompanying printed manuals for students and instructors, were produced. They are useful for training programs in construction, road building, pipeline work and heavy equipment operation. The videotapes use a dramatic approach to show what can happen when safety is ignored.

In "Breakout" a pipeline operation is the scene of a serious injury involving heavy equipment. "Trenching: A Grave Affair" depicts poor work practices, supervisory weaknesses and an unorganized rescue attempt following a trench cave-in. "Child's Play" deals with workers' attitudes toward safety. A roll-over of heavy equipment and consequent fatality are the result of a drug or alcohol impaired worker failing to use safety devices.





## Hazardous Gases

*Three young factory workers, each with only six months experience, entered a tank containing toxic fumes. All were overcome by the fumes and died. One worker apparently entered the tank and, when he collapsed, the other workers entered the tank to rescue him.*

Every year, workers are killed or hospitalized because of exposure to hazardous gases such as carbon monoxide and hydrogen sulfide. Vicom Ltd. produced a videotape that emphasizes the need for rescuers to protect themselves first, by putting on self-contained breathing apparatus, before attempting to save a downed co-worker.

In the 12-minute videotape, five workers describe their exposure to a hazardous gas and the consequences of failing to take safety precautions. Not only were the workers affected by gas poisoning, but so were their families, fellow workers and employers.

The videotape is designed for use in any training program for workers who may be exposed to hazardous gases. It is part of a mandatory safety program at Syncrude Canada.



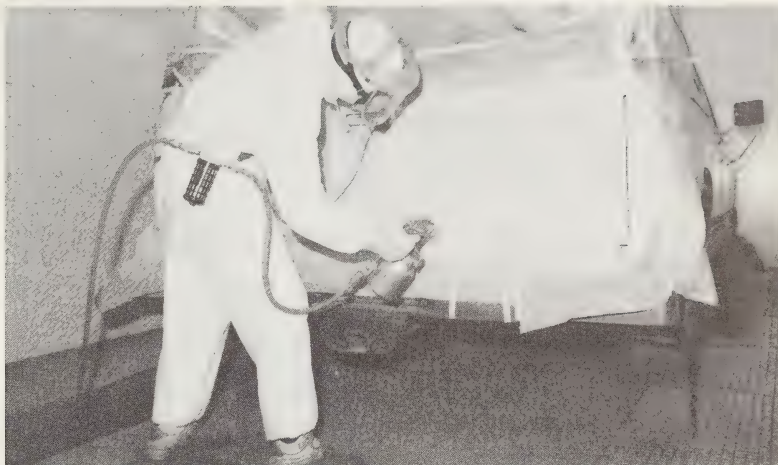
**S**afety officers are aware of many hazards which can injure workers.

Engineering methods, administrative procedures (such as safe work practices) and the substitution of safer alternatives can minimize these hazards.

Personal protective equipment protects workers where the hazards cannot be eliminated.

In an era when new technologies, equipment and substances are constantly being adopted by industry, the periodic evaluation of safety

procedures is essential. The Occupational Health and Safety Heritage Grant Program supports projects which evaluate the safety of engineering methods, personal protective equipment, work procedures and other activities.



## Respiratory Protective Equipment

*A worker in a radiator repair shop inhaled some gases. He was diagnosed as suffering from lead poisoning, and was off work for five months.*

Respiratory protective equipment is absolutely vital in any work situation where a workers' health may be endangered by toxic gas or the lack of oxygen. In this project, undertaken by Manecon Partnership, the researchers

interviewed a cross-section of safety professionals, equipment users and others to discover concerns about the respiratory protection equipment currently used in Alberta.

Issues raised include: the production of low moisture air in compressor supply systems, the use of non-certified air supply hose, guidelines for rigid air supply lines, the safety of "buddy breathing," corrosion of equipment components and training needs.

A significant portion of the report outlines the proper design and selection of breathing air supply systems to produce high quality and reliable breathing air.



## Organization Design and Petrochemical Accidents

Although safety programs often emphasize the role of the worker in accident prevention, the structure of an organization itself can influence the prevention and management of industrial accidents. The Department of Organizational Analysis, University of Alberta, examined certain organizational factors for their impact in reducing risks to workers and the public. These factors included reporting structures, lines of communication, rules and policies, and incentive systems.

The researchers analyzed four major petrochemical accidents in Alberta. The incidents caused widespread damage and threat to human life. They resulted in the deaths of four workers and numerous other injuries.

The study identified several structural, organizational and managerial weaknesses which emerged before, during and after the incidents. The researchers made several recommendations for organizations to follow in order to overcome these difficulties. In addition, five case studies were developed as educational tools for management training purposes.

## The Small Business View of Occupational Health and Safety

*A worker with a small construction firm strained his back while helping his employer to carry a compressor down some stairs. He was unable to work for two weeks.*

From an occupational health and safety point of view, small businesses are of special concern. Small businesses tend to be concentrated in high hazard industries and, within those industries, small companies tend to be more hazardous than larger ones. Owners or managers of small businesses are often less aware of workplace health hazards and unable to afford the costs of reducing occupational health risks.

Occupational health service professionals often cite a problem of "attitudes" with small business owners and managers. However, there has been little research into the structure and function of small businesses in relation to occupational health and safety "attitudes."

The University of Calgary, Department of Community Health Sciences is conducting an exploratory study to describe and analyze the occupational health beliefs, attitudes and practices of small business owners and managers. Fifty-six owners of small businesses were selected for in-depth interviews. The businesses were chosen from high-risk and other industrial sectors — mining, construction, manufacturing, transportation and utilities, and service.

Preliminary results were presented at the Canadian Sociology and Anthropology Association annual conference in June 1987.

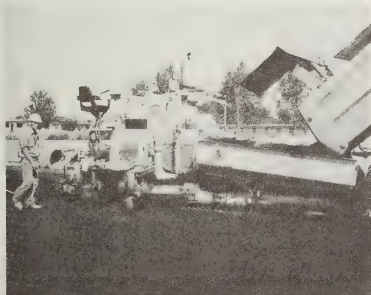




## Respiratory Exposure of Road Building Workers

Road work is not only hot and dirty, it can cause illness. Dusts, silica and asphalt smoke represent a respiratory health hazard to road workers.

Because background studies on the levels of exposure of Alberta road workers had not been done, the Alberta Roadbuilders Association carried out such a project. The project assessed respiratory hazard exposures at a sample of gravel-crushing plants and paving sites across Alberta.



The project's report identified situations requiring modified work procedures, source containment of emissions and respiratory protection. Guidelines for reducing exposure to silica and coal tar pitch volatiles were developed. These include the expansion of worker training in hazard recognition, and the increased use of protective working enclosures and respiratory protective equipment.

## Worker Exposure to Ethylene Oxide

Hospital workers and administrators have known for some time that ethylene oxide (EtO) is a potential human carcinogen. For the sterilization of many medical and dental instruments, however, there is no substitute for EtO.

Exact EtO exposure values for sterilization workers are very scarce in Canada. Because of this, a project to collect and evaluate realistic exposure data for Alberta hospitals was urgently needed.

The University of Calgary, Department of Community Health Sciences took on this work. Using worker questionnaires and on-site measurements, the researchers investigated the use pattern of EtO, examined worker awareness of EtO toxicity, produced realistic estimates of worker exposure and established an aerodynamic model of exposure mechanisms.

All personal exposure concentrations were well within provincial requirements. However, even at these low levels of exposure, symptoms were more likely to be reported by those workers who were somewhat more exposed. The report recommended the use of efficient exhaust ventilation, negative pressurization of the sterilizer room and development of a worker awareness program.

Results of the study were presented at the 1988 American Industrial Hygiene Association conference. Over 50 copies of the comprehensive report have been distributed to EtO sterilizer users.



**E**ducation is key to the success of any occupational health and safety program. The Grant Program has been instrumental in improving the quality and availability of training programs across Alberta.

The Province is fortunate to have high-quality, post-secondary educational institutions able to deliver such programs. The Grant Program has supported a number of education initiatives at these institutions, an investment which yields an annual return.

As a result of safety courses and training programs, the number of trained and knowledgeable Alberta workers increases every year. Because they have been exposed to up-to-date information and state-of-the-art safety techniques, these workers are able to make decisions daily to follow safe work practices. Also, the number of professionals trained in occupational medicine and nursing has increased significantly.

The benefits of training accrue not only to those who take the courses, but also to their employers and their fellow workers.

## Occupational Health Nursing

As awareness of occupational health and safety problems increases, so does the need for trained professionals. The "front line" safety person in most large organizations is the occupational health nurse. In fact, government regulations specify that large work sites (200 or more workers per shift) must have a nurse on duty.

Grant MacEwan Community College has a mandate to provide the Alberta Occupational Health Nursing Certificate program, traditionally offered as a one-year full-time program in Edmonton. In the past, if nurses from outside the city wished to take the course, they had to leave their jobs and move to Edmonton for the year.





## The Occupational Health Program

As a first step in making this training more widely available, the Grant Program funded two special sessions of the course in Calgary beginning in 1981. Seventy nurses graduated from these sessions.

In 1984, another project aimed at re-developing the course to make it more accessible to nurses across the province. The new course is in a self-study format supplemented by telephone contact with instructors, teleconferencing and audio/videotapes. Nurses can now obtain credit towards the Occupational Health Nursing Certificate without leaving home.

The re-developed program was first offered in September 1987. The response was enthusiastic. Applications to the province-wide program were up almost 800 percent over those to the previous year's on-campus offering.

Pat Bayliss, a registered nurse in Edson who was one of the first 100 students accepted into the new course, says, "Living in a rural community, it would have been impossible for me to improve my education in occupational health nursing without this outreach program. It has been very informative and relates well to my work."

Although they are fierce competitors in the business world, Shell Canada Ltd., NOVA Corporation of Alberta, Celanese Canada Ltd. and Petro-Canada all agree on the importance of occupational health. Contributions from these four companies, and a matching contribution from the Occupational Health and Safety Heritage Grant Program, enabled the University of Alberta to establish the Occupational Health Program. The Energy and Chemical Workers Union played a key role in raising the necessary funds.

The program provides a much-needed academic focus for occupational health in a university setting. An international search led to the selection of Dr. Tee Guidotti for the Chair in Occupational Health.

Since the program began in 1984, Dr. Guidotti's group has been active on a number of fronts. In the research area, a study on cancer incidence in Strathcona County and Fort Saskatchewan was recently completed. Mortality surveys of fire fighters and transit workers, and several toxicology studies are under way. Results of the program's research work have been reported in more than 40 scientific papers and presented at over 40 major meetings.

Besides consulting with industry, labour and government, Dr. Guidotti provides clinical services to workers. He has seen numerous patients, most often those with difficult-to-diagnose conditions.

Teaching is another facet of the program. Through courses and lectures by program staff, university students are exposed to the latest occupational health prevention and treatment information. Courses have been given to over 500 medical undergraduate and post-graduate students. A number of continuing education lectures to health professionals have also been provided. To keep up with the expanding field of occupational health, Dr. Guidotti's group has assembled a comprehensive library for staff and students.

Future plans for the University of Alberta program include establishing more training opportunities in occupational medicine, and strengthening ties with occupational health programs outside Canada.



## Baccalaureate Design Project

Occupational health and safety practitioners normally acquire expertise through a combination of experience, in-house training and short courses. There is no standardized career path and, significantly, none of Canada's sixty or so universities at present offer a baccalaureate degree in occupational health and safety.

A grant enabled Athabasca University to research the educational needs of occupational health and safety practitioners, with a view to the University developing an undergraduate degree program. The study is an important step in the movement towards professionalism in the occupational health and safety field.

The extensive report (320 pages) prepared by Athabasca University was based on a comprehensive information search, 1200 replies to a questionnaire and 130 personal interviews. The project identified the target student population and its educational requirements, reviewed occupational health and safety courses at other Canadian post-secondary institutions, constructed a data base of material relevant to the development of such an educational program, and made recommendations for the design of a degree program in occupational health and safety.

Athabasca University is now reviewing this information. Nationally, 1500 individuals, institutions and agencies are using the information in the report to assess local programs and as a springboard for discussions about professional requirements for health and safety practitioners.

## The Occupational Safety Certificate Program

Because a variety of instructors teach courses in its Certificate Program in Occupational Safety, the University of Alberta, Faculty of Extension became concerned about consistency from course to course. Although the Faculty wanted to retain the valuable input of various expert lecturers, it also wanted to ensure consistency in course content from one term to the next.

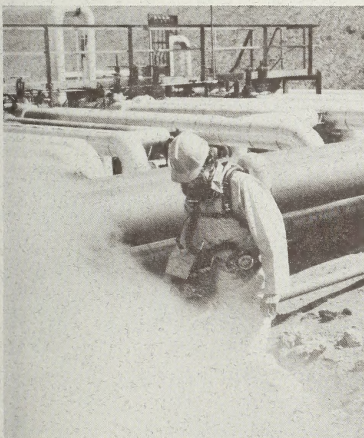
Detailed curricula and instructors' manuals were the solution. A grant funded the preparation of this material for four core courses and two seminars. The manuals were completed in 1984 and pilot tested from 1985 to 1987.

Most students in the program are safety personnel from industry and government. About 100 students are currently enrolled in the program, with approximately 20 graduating each year. The program is recognized by the Association of Canadian Registered Safety Professionals and can form part of the requirements for membership.



## Hydrogen Sulfide Training Program

Hydrogen sulfide ( $H_2S$ ) is a silent killer. The poisonous gas claimed the lives of 23 Alberta workers between 1976 and 1987. Of all the lost-time claims resulting from hydrogen sulfide exposures for the same period, more than two-thirds affected oil and gas industry workers. Almost any occupation related to the exploration for or production of oil or gas can face exposure to hydrogen sulfide.



Education plays a key role in protecting workers from hydrogen sulfide. In 1985, the Petroleum Industry Training Service began teaching 8000-10000 workers per year about the hazards. But some parts of the course, developed by industry in 1978, are now out of date because knowledge about hydrogen sulfide has increased and new technologies to deal with the gas are in use.

The Grant Program was able to fill the gap by funding the development of three updated hydrogen sulfide safety courses. Their focus is practical and hands-on. "H<sub>2</sub>S Alive" is a one-day course directed at all workers. "H<sub>2</sub>S Rescue" adds another day of instruction and provides rescue practice with personal protective equipment. "H<sub>2</sub>S Instructor" certifies instructors to teach the other two courses and includes helpful tips on adult teaching techniques.

"Education must come first," says John Dmitri, an Occupational Health and Safety Officer with the Occupational Health and Safety Division. "It's no good having breathing apparatus or detection equipment if workers are not trained in their use."

Over 8000 workers are expected to take these new courses each year.



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